MADISON AQUIFER - SOUTH DAKOTA - ESTIMATES

- ♦♦♦ 47 hydrology studies of Black Hills since 1909 (24 by USGS)
  - ♦♦♦ 36 hydrology studies of Madison Aquifer
- ♦♦♦ Volume 12,066 million acre feet
- ♦♦♦ Porosity 11%
- ♦♦♦ Storage 1,327 million acre feet
- ♦♦♦ Obtainable (from wells) 603 million acre feet
- ♦♦♦ Recharge rate 2 million acre feet/year
- ♦♦♦ * State appropriations 87,116 acre feet/year
  - ♦♦♦ this is .1% of obtainable supply
  - ♦♦♦ this is 4% of annual recharge rate

STATE APPROPRIATIONS (TOTALS)

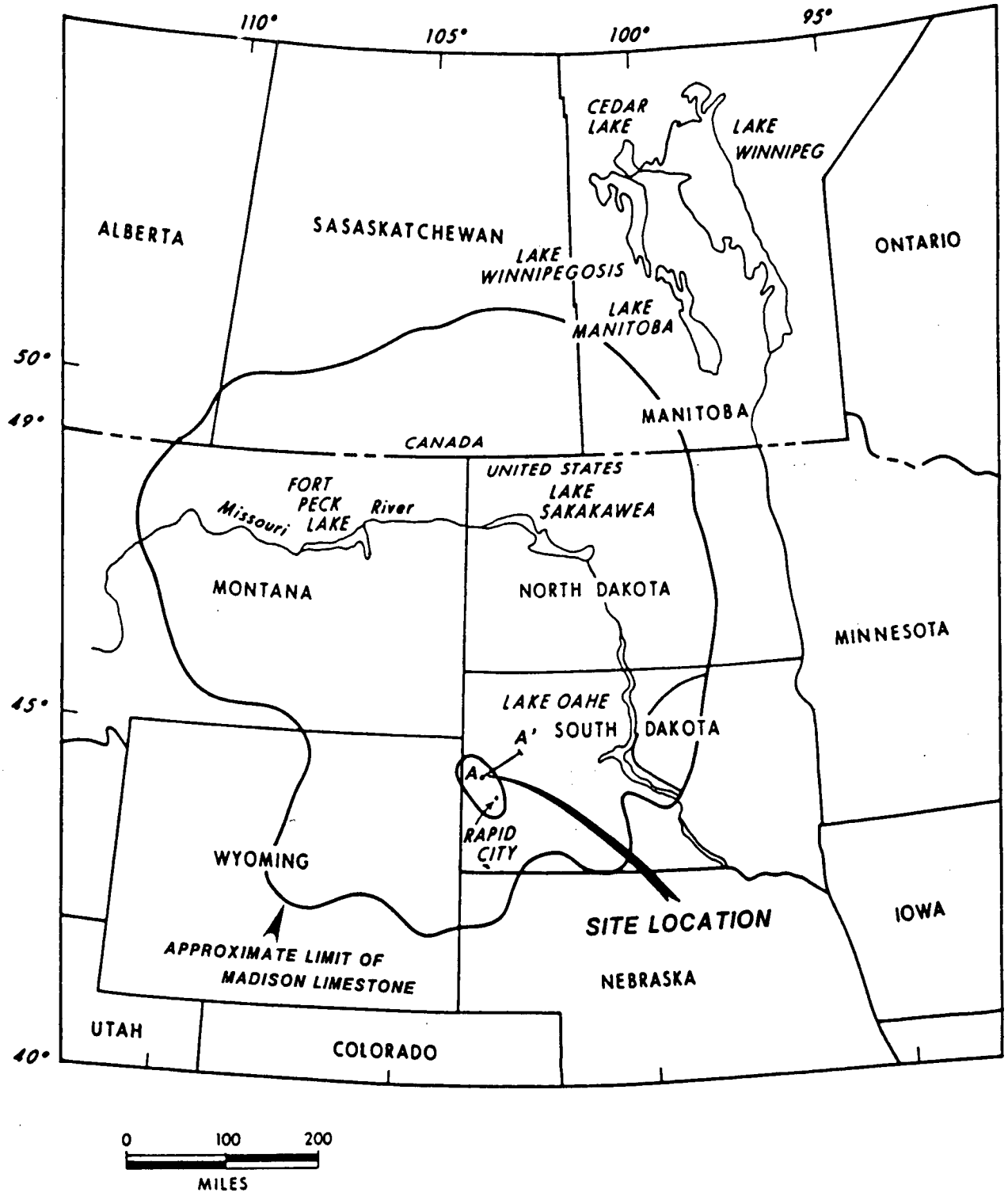
	CFS	AFY
Irrigation	53.66	41,011
Municipal	47.7	34,474
Rwd/Swd	8.06	5,824
Ind/Comm	8.24	5,955
Geothermal	2.7	1,951
Total	**120.36 cfs**	**87,116**

Brohm Mining Corporation

Appropriation sought	3,225 AFY
First six months use	3,225 AF½Y
Next 15 years use	1,613 AFY
Less - surface collection (based on normal precipitation)	(726 AFY)
Actual Average Use of Madison Aquifer	**887 AFY**

* Appropriations typically 2 to 3 times greater than actual use.

SOURCE: ADRIAN BROWN CONSULTANTS, 155 SOUTH MADISON, SUITE 302, DENVER, COLORADO 80209. 303)399-9630


110°
105°
100°
95°
50°
49°
45°
40°
ALBERTA
SASASKATCHEWAN
ONTARIO
CEDAR LAKE
LAKE WINNIPEG
LAKE WINNIPEGOSIS
LAKE MANITOBA
MANITOBA
CANADA
UNITED STATES
FORT PECK LAKE
Missouri River
LAKE SAKAKAWEA
MONTANA
NORTH DAKOTA
MINNESOTA
LAKE OAHE
A'
A
SOUTH DAKOTA
RAPID CITY
WYOMING
SITE LOCATION
IOWA
APPROXIMATE LIMIT OF MADISON LIMESTONE
NEBRASKA
UTAH
COLORADO
0
100
200
MILES

STATE OF SOUTH DAKOTA
MADISON AQUIFER
PERMITS AND APPROPRIATIONS *(CFS)

COUNTY	IRRIGATION	MUNICIPAL [1]	RURAL WATER DEVELOPMENT SUBURBAN HOUSING DEVELOPMENT	INDUSTRIAL COMMERCIAL	GEOTHERMAL	TOTAL CFS	NO. PERMITS	= GPM
Butte	26.02 (5)	2.23 (1)	1.34 (3)	—	—	29.59	(9)	13,256.32
Fall River	9.36 (1)	4.59 (4)	—	2.55 (2)	—	16.50	(7)	7,392.00
Haakon	11.12 (2)	2.55 (3)	—	—	2.7 (2)	16.37	(7)	7,333.76
Lawrence	5.16 (5)	7.00 (5)	0.42 (3)	1.47 (4)	—	14.05	(17)	6,294.40
Meade	—	5.70 (3)	3.50 (3)	—	—	9.20	(6)	4,121.60
Pennington	—	4.06 (4)	2.80 (12)	2.00 (1)	—	8.86	(17)	3,969.28
Perkins	—	4.45 (1)	—	—	—	4.45	(1)	1,993.60
Hughes	—	—	—	2.22 (1)	—	2.22	(1)	994.56
Stanley	2.00 (1)	—	—	—	—	2.00	(1)	896.00
Dewey	—	1.02 (1)	—	—	—	1.02	(1)	457.96
Ziebach	—	.50 (1)	—	—	—	0.50	(1)	224.00
TOTAL CFS	53.66	32.10	8.06	8.24	2.7	104.76		
TOTAL GPM	24,040	14,381	3,611	3,692	1,210			46,932.48
PERMIT NO	(14)	(23)	(21)	(8)	(2)		(68)	

MUNICIPALITIES [1]

SPEARFISH	7.00 (5)
STURGIS	5.70 (3)
EDGEMONT	4.59 (4)
LEMMON	4.45 (1)
BELLE FOURCHE	2.23 (1)
BOX ELDER	2.22 (2)
MIDLAND	1.33 (1)
PHILLIP	1.22 (2)
EAGLE BUTTE	1.02 (1)
WALL	1.00 (1)
RAPID CITY **	.84 (1)
DUPREE	.50 (1)

* DWNR - MARCH, 1989
** CURRENTLY SEEKING APPROPRIATION OF 7,000 GPM OR 15.6 CFS

MEMORANDUM

FROM: Adrian Brown Ref:1182/891113sb.bro

TO: Doug Stewart, Brohm

RE: Hydrology References

DATE: November 13, 1989

We have been asked to provide a bibliography of the investigation papers into the Madison Aquifer and groundwater resources in the vicinity of the Black Hills. Please find below a listing of the references that we have or know of, in date order.

1909a Geology and Underground Waters in South Dakota. United States Geological Survey Water-Supply Paper 227.

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